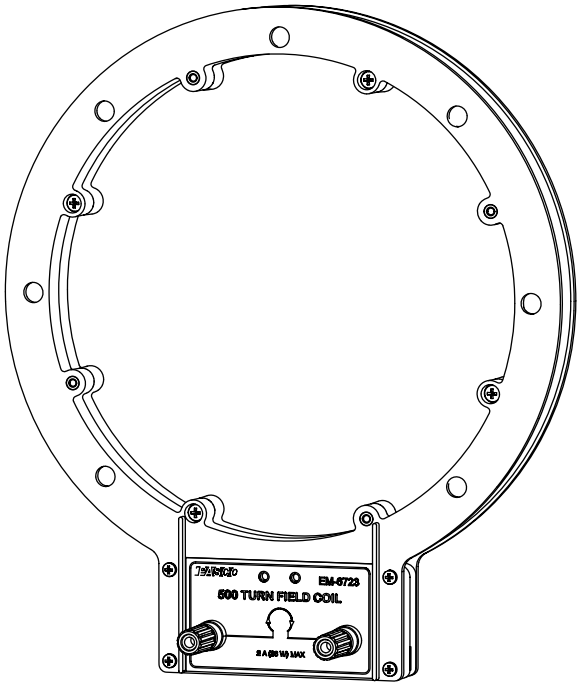
500-Turn Field Coil

EM-6723



Included Equipment	Part Number
500-Turn Field Coil	EM-6723
Related Equipment	
200-Turn Field Coil	EM-6711
Detector Coil (400 turn)	EM-6712
Detector Coil (2000 turn)	EM-6713
Helmholtz Base	EM-6715
Recommended Equipment to Drive Coil (one needed)	
ScienceWorkshop 750 Interface	CI-7650
GLX Power Amplifier	PS-2006
Low Voltage AC/DC Power Supply	SF-9584A
Digital Function Generator/Amplifier	PI-9587C

Introduction

PASCO model EM-6723 is a 500-turn wire coil on a ring-shaped bobbin with a diameter of about 21 cm. The base of the assembly has two binding posts for connecting 4 mm banana plugs. Use the binding posts to connect a device to the coil. Do not allow the current to exceed 2 A.

A 1/4-20 threaded mounting hole in the base allows the coil to be fastened to other equipment, such as the EM-6715 Helmholtz Base.

Holes in the sidewalls of the bobbin allow students to see how the coil is wound. The holes are tangent with the inside of the winding so that students can measure the inner diameter.

Experiments

In combination with other equipment, the 500-Turn Field Coil can be used in a variety of demonstrations and experiments, including the following.

- Mount two field coils on the Helmholtz Base (EM-6715) to create a Helmholtz coil.
- Drive the field coil with a triangle wave at about 500 Hz. Use an oscilloscope to measure the emf induced in a detector coil. Move the detector coil to find the strength and direction of the magnetic field at various locations. Measure how the induced emf depends on the angle between the field coil and the detector coil. Vary the driving frequency to measure how the induced emf depends on the time rate of change of the magnetic field.

  For details of this experiment see Christopher C. Jones, Faraday's Law apparatus for the freshman laboratory, *American Journal of Physics* 1987; 55 (12): 1148–1150.
- Do the above experiment with a *ScienceWorkshop* 750 interface and a voltage sensor. Use the voltage sensor to measure

the induced emf in the detector coil.

- Drive the coil with direct current. Use a magnetic field sensor to find the strength and direction of the field at various locations.

Specifications

Turns	500
Wire	copper, 22 AWG (0.64 mm diameter)
Inner radius	10.06 cm
Outer radius	11.37 cm
Coil width	1.6 cm
Body material	Polycarbonate plastic

Technical Support

For assistance with any PASCO product, contact PASCO at:

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